SECTION 4. CHECKING AN FAA PROPOSED ILS FREQUENCY WITH THE AAM

31. ILS FREQUENCY STUDY PROCEDURE.

a. The AAM must be used to determine whether a proposed FAA ILS localizer frequency will be compatible with the existing FM broadcast environment. This is a case where the FAA must accept the status quo for any and all FM stations either operating or which have been approved within the OE case process.

b. To start, select an ILS channel for the proposed installation in accordance with Section 3 of this appendix, then proceed with the steps outline in paragraph 32, below.

32. STEP BY STEP STUDY PROCEDURE.

a. **Select** "NAVAID to be analyzed."

b. **Type "M"** for manual NAVAID entry.

c. **Enter NAVAID coordinates**.

d. **Enter NAVAID frequency**.

e. **Enter NAVAID front course**.

f. **Select service volume**.

g. **Complete prompts**.

h. **Type *"F8"***. Complete field elevation, runway length and antenna type.

i. **Type *"F8"***. Proceed to edit FM list as normally.

j. **Mass delete** by pressing *ALT-F5*.

k. **Alt-P changes** in all remaining entries from *"0"* to *"1"* in the proponent column.

l. **Type "2"** for all "1" in the proponent column.

m. **Press** *ALT-F10* to run program. All station selected will be run as a proponent. This is done to assure the ILS will fit into the present environment.

n. **When the run is completed**, print the list as normal.

o. **If the run is clear**, the frequency is OK. If there are plots generated, plot them as normally. See figures 31-33. Vertical plots are not needed, since any problem at any altitude

within the FPSV will rule out selecting that frequency for an ILS.

p. If there is a problem, return to "edit", bring up the test run and change the frequency to a new proposed frequency in the ILS data line. When a run is clear, that frequency is OK.

33. STUDY RESULTS.

a. If there are no IM points, then the selected frequency is satisfactory, as far as the in-place FM broadcast environment is concerned. It has been run against all FM stations within the search range, each being used independently as a PROP.

b. If there is any IM point, then the FM stations making up the IM combination must be further studied to include the proper antenna type, duplicate applications, etc. If there are still IM points, the frequency is not usable since the FM stations are in place and FAA cannot ask an FM station to move to accommodate a new ILS frequency.

c. Sample runs have been made for the lowest and highest assignable ILS localizer frequencies of 108.3 and 111.9 MHz, as shown in figures 145 - 149. On 108.3 MHz, there are IM points, but for 111.9 MHz, there are none.

34. thru 40. RESERVED.

FIGURE 145. SAMPLE TEST RUN FOR 108.3 MHZ

PRINT DATE: 04-15-1993 14:50:44 RFI .PRT TEST

Airspace case #: TEST Site: MERCED, CA
Date: 041593
Navaid Identifier: LOC
Navaid Frequency (MHz): 108.30

Navaid Latitude: 37. 22 51
Navaid Longitude: 120. 35 3

Runway Heading (True): 360.0
Runway Elevation (Ft. MSL): 188.
Runway Length (Ft): 5903.

Prop Stat	ID	Call	Freq (MHz)	Latitude	Longitude	ERP (Kw)	Height (MSL)	Range (NM)	Radial (True)	Lic Stat
*	1	KMPO	88.70	37. 32 0	120. 1 29	2.050	4301.	28.17	251.05	L
*	2	KBES	89.50	37. 35 21	120. 57 23	.150	223.	21.69	125.20	C
*	3	KEFR	89.90	37. 32 1	120. 1 50	1.800	4364.	27.92	250.83	L
*	4	KADV	90.50	37. 36 26	120. 57 26	1.500	207.	22.36	127.41	L
*	5	KDHS	90.50	37. 39 25	120. 58 20	.010	187.	24.81	131.89	L
*	6	KBDG	90.90	37. 29 59	120. 49 41	.140	190.	13.63	121.55	L
*	7	KCSS	91.90	37. 31 35	120. 51 25	.150	157.	15.65	123.91	C
*	8	KXMX	92.10	36. 57 58	120. 2 6	25.000	587.	36.17	313.46	L
*	9	KVRQ	92.50	37. 16 42	120. 37 33	6.000	456.	6.46	17.91	A
*	10	NEWx	93.30	37. 12 30	120. 15 0	3.000	604.	19.01	302.98	A
*	11	KXDA	93.30	37. 13 1	120. 11 57	3.000	676.	20.84	298.15	C
*	12	NEWx	93.90	37. 38 16	121. 3 7	3.000	404.	27.08	124.70	A
*	13	NEWx	93.90	37. 38 31	120. 59 49	3.000	233.	25.13	128.57	A
*	14	NEWx	93.90	37. 42 25	120. 59 35	3.000	423.	27.59	135.17	A
*	15	KYAJ	94.10	37. 17 5	120. 24 9	3.000	551.	10.41	303.64	C
*	16	KTAA	94.30	36. 44 29	120. 5 8	3.000	528.	45.19	328.11	L
*	17	NEW-	94.30	37. 32 20	120. 3 54	.120	4150.	26.48	249.02	A
*	18	NEW-	94.30	37. 36 24	121. 2 37	.010	449.	25.73	121.78	A
*	19	KDJK	95.10	37. 47 34	120. 31 8	29.500	1421.	24.91	187.16	L
*	20	KNTO	95.90	37. 18 57	120. 43 20	3.000	413.	7.65	59.36	L
*	21	KUBB	96.30	37. 32 0	120. 1 29	1.900	4390.	28.17	251.05	L
*	22	NEWx	97.10	37. 28 7	121. 13 58	1.800	1309.	31.35	99.67	A
*	23	NEWx	97.10	37. 29 28	121. 13 28	3.000	974.	31.21	102.24	A
*	24	KABX	97.50	37. 22 31	120. 27 37	50.000	692.	5.92	273.23	L
*	25	KMIX	98.30	37. 34 46	120. 50 48	2.000	515.	17.27	133.64	L
*	26	KMIX	98.30	37. 34 46	120. 50 48	4.000	515.	17.27	133.64	A
*	27	KFMK	98.70	37. 22 31	120. 27 37	4.400	640.	5.92	273.23	C
*	28	KCIV	99.90	37. 32 0	120. 1 29	1.850	4360.	28.17	251.05	L
*	29	KAMB	101.50	37. 26 27	120. 8 39	17.000	2113.	21.28	260.26	C
*	30	KAMB	101.50	37. 27 59	120. 14 9	50.000	1283.	17.37	252.81	L
*	31	KJSN	102.30	37. 40 47	120. 55 28	6.000	417.	24.16	137.92	A
*	32	NEWx	103.10	36. 47 30	120. 30 0	3.000	551.	35.58	353.50	A
*	33	KHOV	103.90	37. 32 0	120. 1 29	.070	4334.	28.17	251.05	C
*	34	KHTN	104.70	37. 11 29	120. 32 3	50.000	617.	11.61	348.14	L
*	35	KHTN	104.70	37. 16 44	120. 37 35	50.000	620.	6.44	18.23	A

FIGURE 146. SAMPLE TEST RUN FOR 108.3 MHZ (CONTINUED)

PRINT DATE: 04-15-1993 14:50:44 RFI .PRT TEST

*	36	KVPC	105.50	36. 40 51	120. 9 53	3.000	515.	46.56	334.44	C
*	37	KFIE	106.30	37. 25 34	120. 26 23	2.950	771.	7.40	248.47	L
*	38	KQLB	106.90	36. 55 35	120. 50 42	6.000	843.	29.98	24.58	C
*	39	KMMM	107.30	36. 55 11	120. 7 3	3.000	561.	35.55	321.11	C
*	40	KXDE	107.70	37. 22 5	120. 27 10	3.000	571.	6.31	276.98	C

Interference thresholds are computed for receiver locations based on calculated field strength for a 15-Element V-Ring localizer array.

Listing of A2/B2 Evaluations

Freq (MHz)	ID	Call	Offset (MHz)	#Pts

No A2/B2 points found.

Listing of 2-frequency intermodulation (B1) combinations

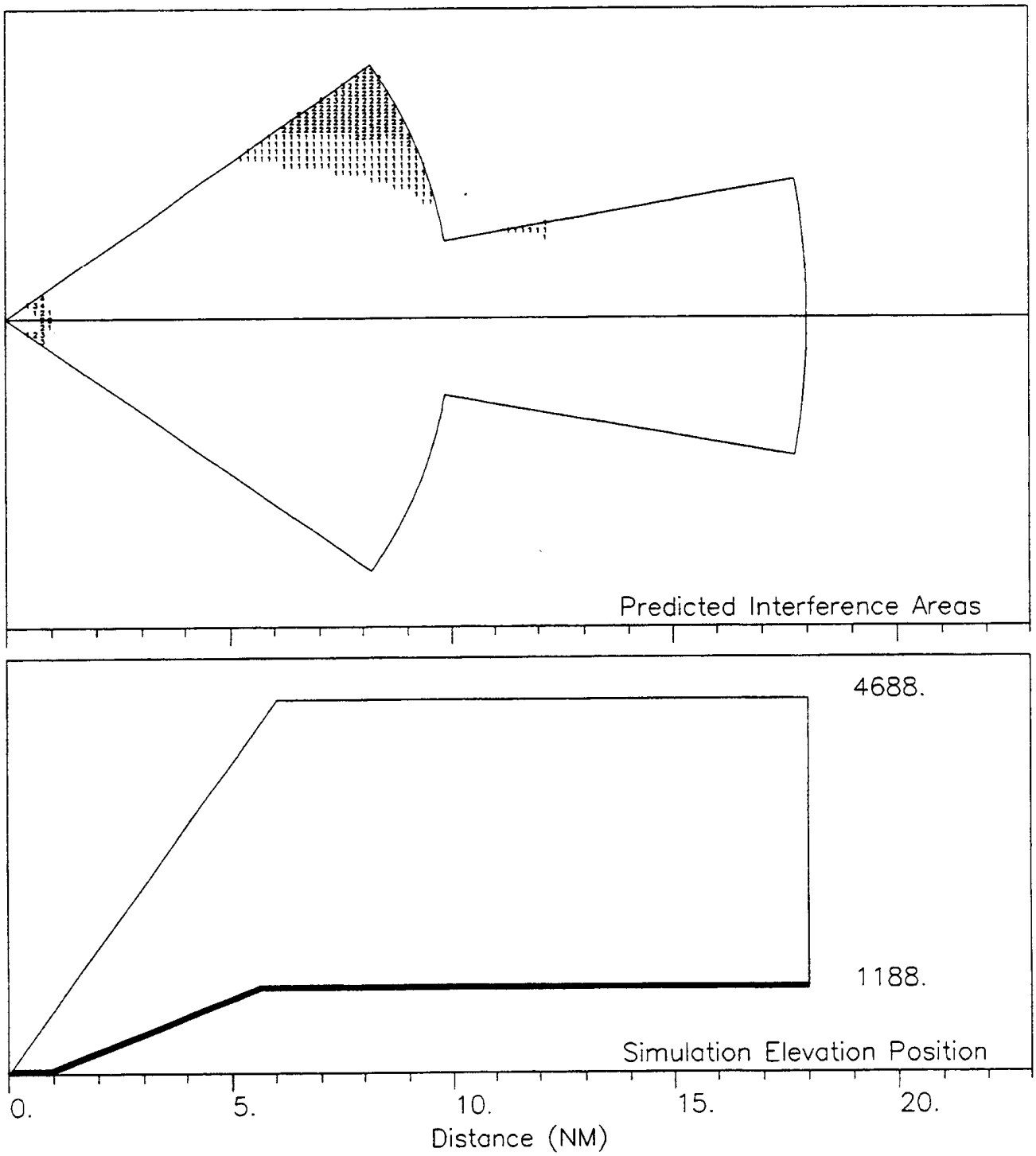
Freq 1 (MHz)	ID	Call	Freq 2 (MHz)	ID	Call	IMod (MHz)	Offset (KHz)	#Pts

No 2-frequency intermodulation interference found.

Listing of 3-frequency intermodulation (B1) combinations

Freq 1 (MHz)	ID	Call	Freq 2 (MHz)	ID	Call	Freq 3 (MHz)	ID	Call	IMod (MHz)	Offset (KHz)	#Pts
107.70(	40)	KXDE	106.90(	38)	KQLB	106.30(	37)	KFIE	108.30	0	254

FIGURE 147. PLOT OF FIGURE 145



Airspace case #: TEST Site: MERCED, CA
Date: 041593 Plot filename: 14_12_11.plt Service Volume Bottom
Intermod (B1) plot: KXDE (40), KQLB (38), & KFIE (37)
Frequencies: KXDE = 107.70 MHz KQLB = 106.90 MHz KFIE = 106.30 MHz
Navaid: LOC Frequency: 108.30 MHz Elevation (Ft. MSL): 188.
Runway heading: 360.0

FIGURE 148. SAMPLE TEST RUN FOR 111.9 MHZ

PRINT DATE: 04-15-1993 14:41:28 RFI .PRT TEST

Airspace case #: TEST Site: MERCED, CA
Date: 041593
Navaid Identifier: LOC
Navaid Frequency (MHz): 111.90

Navaid Latitude: 37. 22 51
Navaid Longitude: 120. 35 3

Runway Heading (True): 360.0
Runway Elevation (Ft. MSL): 188.
Runway Length (Ft): 5903.

Prop Stat	ID	Call	Freq (MHz)	Latitude	Longitude	ERP (Kw)	Height (MSL)	Range (NM)	Radial (True)	Lic Stat
*	1	KMPO	88.70	37. 32 0	120. 1 29	2.050	4301.	28.17	251.05	L
*	2	KBES	89.50	37. 35 21	120. 57 23	.150	223.	21.69	125.20	C
*	3	KEFR	89.90	37. 32 1	120. 1 50	1.800	4364.	27.92	250.83	L
*	4	KADV	90.50	37. 36 26	120. 57 26	1.500	207.	22.36	127.41	L
*	5	KDHS	90.50	37. 39 25	120. 58 20	.010	187.	24.81	131.89	L
*	6	KBDG	90.90	37. 29 59	120. 49 41	.140	190.	13.63	121.55	L
*	7	KCSS	91.90	37. 31 35	120. 51 25	.150	157.	15.65	123.91	C
*	8	KXMX	92.10	36. 57 58	120. 2 6	25.000	587.	36.17	313.46	L
*	9	KVRQ	92.50	37. 16 42	120. 37 33	6.000	456.	6.46	17.91	A
*	10	NEWx	93.30	37. 12 30	120. 15 0	3.000	604.	19.01	302.98	A
*	11	KXDA	93.30	37. 13 1	120. 11 57	3.000	676.	20.84	298.15	C
*	12	NEWx	93.90	37. 38 16	121. 3 7	3.000	404.	27.08	124.70	A
*	13	NEWx	93.90	37. 38 31	120. 59 49	3.000	233.	25.13	128.57	A
*	14	NEWx	93.90	37. 42 25	120. 59 35	3.000	423.	27.59	135.17	A
*	15	KYAJ	94.10	37. 17 5	120. 24 9	3.000	551.	10.41	303.64	C
*	16	KTAA	94.30	36. 44 29	120. 5 8	3.000	528.	45.19	328.11	L
*	17	NEW-	94.30	37. 32 20	120. 3 54	.120	4150.	26.48	249.02	A
*	18	NEW-	94.30	37. 36 24	121. 2 37	.010	449.	25.73	121.78	A
*	19	KDJK	95.10	37. 47 34	120. 31 8	29.500	1421.	24.91	187.16	L
*	20	KNTO	95.90	37. 18 57	120. 43 20	3.000	413.	7.65	59.36	L
*	21	KUBB	96.30	37. 32 0	120. 1 29	1.900	4390.	28.17	251.05	L
*	22	NEWx	97.10	37. 28 7	121. 13 58	1.800	1309.	31.35	99.67	A
*	23	NEWx	97.10	37. 29 28	121. 13 28	3.000	974.	31.21	102.24	A
*	24	KABX	97.50	37. 22 31	120. 27 37	50.000	692.	5.92	273.23	L
*	25	KMIX	98.30	37. 34 46	120. 50 48	2.000	515.	17.27	133.64	L
*	26	KMIX	98.30	37. 34 46	120. 50 48	4.000	515.	17.27	133.64	A
*	27	KFMK	98.70	37. 22 31	120. 27 37	4.400	640.	5.92	273.23	C
*	28	KCIV	99.90	37. 32 0	120. 1 29	1.850	4360.	28.17	251.05	L
*	29	KAMB	101.50	37. 26 27	120. 8 39	17.000	2113.	21.28	260.26	C
*	30	KAMB	101.50	37. 27 59	120. 14 9	50.000	1283.	17.37	252.81	L
*	31	KJSN	102.30	37. 40 47	120. 55 28	6.000	417.	24.16	137.92	A
*	32	NEWx	103.10	36. 47 30	120. 30 0	3.000	551.	35.58	353.50	A
*	33	KHOV	103.90	37. 32 0	120. 1 29	.070	4334.	28.17	251.05	C
*	34	KHTN	104.70	37. 11 29	120. 32 3	50.000	617.	11.61	348.14	L
*	35	KHTN	104.70	37. 16 44	120. 37 35	50.000	620.	6.44	18.23	A

FIGURE 149. SAMPLE TEST RUN FOR 111.9 MHZ (CONTINUED)

```
        PRINT DATE: 04-15-1993  14:41:28  RFI     .PRT   TEST

*   36 KVPC  105.50   36. 40 51  120.  9 53   3.000   515.  46.56 334.44   C
*   37 KFIE  106.30   37. 25 34  120. 26 23   2.950   771.   7.40 248.47   L
*   38 KQLB  106.90   36. 55 35  120. 50 42   6.000   843.  29.98  24.58   C
*   39 KMMM  107.30   36. 55 11  120.  7  3   3.000   561.  35.55 321.11   C
*   40 KXDE  107.70   37. 22  5  120. 27 10   3.000   571.   6.31 276.98   C


 Interference thresholds are computed for receiver locations
   based on calculated field strength for a      15-Element V-Ring
   localizer array.


Listing of A2/B2 Evaluations

Freq                                                              Offset
(MHz)    ID  Call                                                  (MHz)   #Pts

   No A2/B2 points found.

Listing of 2-frequency intermodulation (B1) combinations

Freq 1              Freq 2                                  IMod  Offset
 (MHz)   ID  Call    (MHz)   ID  Call                       (MHz)  (KHz)   #Pts

Listing of 3-frequency intermodulation (B1) combinations

Freq 1              Freq 2              Freq 3              IMod  Offset
 (MHz)   ID  Call    (MHz)   ID  Call    (MHz)   ID  Call   (MHz)  (KHz)   #Pts

   No 3-frequency intermodulation interference found.
```

FIGURES 150. thru 154. RESERVED.